



**AFRL-RX-WP-TM-2008-4226**

**TECHNICAL OPERATIONS SUPPORT (TOPS) II**  
**Delivery Order 0002: RX Technology Transfer**

**Universal Technology Corporation**

**SEPTEMBER 2006**  
**Final Report**

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**MATERIALS AND MANUFACTURING DIRECTORATE**  
**WRIGHT-PATTERSON AIR FORCE BASE, OH 45433-7750**  
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**UNITED STATES AIR FORCE**

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| REPORT DOCUMENTATION PAGE  |                             |                              |                                       | Form Approved<br>OMB No. 0704-0188  |  |
|--|-----------------------------|------------------------------|---------------------------------------|---|--|
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| 1. REPORT DATE (DD-MM-YY)<br>September 2006  |                             | 2. REPORT TYPE<br>Final      |                                       | 3. DATES COVERED (From - To)<br>30 March 2001 – 30 September 2006               |  |
| 4. TITLE AND SUBTITLE<br>TECHNICAL OPERATIONS SUPPORT (TOPS) II<br>Delivery Order 0002: RX Technology Transfer   |                             |                              |                                       | 5a. CONTRACT NUMBER<br>F33615-01-D-5801-0002                                    |  |
|  |                             |                              |                                       | 5b. GRANT NUMBER  |  |
|  |                             |                              |                                       | 5c. PROGRAM ELEMENT NUMBER<br>62102F  |  |
| 6. AUTHOR(S)   |                             |                              |                                       | 5d. PROJECT NUMBER<br>4349  |  |
|  |                             |                              |                                       | 5e. TASK NUMBER<br>LO   |  |
|  |                             |                              |                                       | 5f. WORK UNIT NUMBER<br>4349L0T2  |  |
| 7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)<br>Universal Technology Corporation<br>1270 N. Fairfield Road<br>Dayton, OH 45432   |                             |                              |                                       | 8. PERFORMING ORGANIZATION<br>REPORT NUMBER                                     |  |
| 9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)<br>Air Force Research Laboratory<br>Materials and Manufacturing Directorate<br>Wright-Patterson Air Force Base, OH 45433-7750<br>Air Force Materiel Command<br>United States Air Force   |                             |                              |                                       | 10. SPONSORING/MONITORING<br>AGENCY ACRONYM(S)<br>AFRL/RXOB                     |  |
|  |                             |                              |                                       | 11. SPONSORING/MONITORING<br>AGENCY REPORT NUMBER(S)<br>AFRL-RX-WP-TM-2008-4226 |  |
| 12. DISTRIBUTION/AVAILABILITY STATEMENT<br>Approved for public release; distribution unlimited.  |                             |                              |                                       |   |  |
| 13. SUPPLEMENTARY NOTES<br>PAO Case Number: AFRL/WS 07-1541, 27 Jun 2007. This report contains the best quality available.   |                             |                              |                                       |   |  |
| 14. ABSTRACT<br>Analyze progress made on RX materials, manufacturing and structural development programs and assess the desirability and feasibility of transferring the technology to the commercial sector through Cooperative Research and Development Agreements (CRADAs) and other technology transfer vehicles. Assist in the identification of appropriate collaborators and potential technology applications; assist RX personnel in initiating and administering CRADAs, Cooperative Agreements and Other Transactions; and perform other technology transfer functions as needed.   |                             |                              |                                       |   |  |
| 15. SUBJECT TERMS  |                             |                              |                                       |   |  |
| 16. SECURITY CLASSIFICATION OF:  |                             |                              | 17. LIMITATION<br>OF ABSTRACT:<br>SAR | 18. NUMBER<br>OF PAGES<br>32  | 19a. NAME OF RESPONSIBLE PERSON (Monitor)<br>Mark N. Groff<br>19b. TELEPHONE NUMBER (Include Area Code)<br>N/A |
| a. REPORT<br>Unclassified  | b. ABSTRACT<br>Unclassified | c. THIS PAGE<br>Unclassified |                                       |   |  |

NOTE: ML has changed to RX, throughout.

**Title:** ML Technology Transfer

**Objective:** The purpose of this DO was to assist in the transfer of ML developed materials and processes technology to the commercial sector through various technology transfer vehicles.

**Program Description:** Analyze progress made on ML materials, manufacturing and structural development programs and assess the desirability and feasibility of transferring the technology to the commercial sector through Cooperative Research Development Agreements (CRADAs) and other technology transfer vehicles. Assist in the identification of appropriate collaborators and potential technology applications; assist ML personnel in initiating and administering CRADAs, Cooperative Agreements and Other Transactions; and perform other technology transfer functions, as needed.

**Executive Summary:** During the period of this Delivery Order, 46 new CRADAs were signed, 30 existing CRADAs were extended or amended and 34 CRADAs were completed or terminated. At any given time there were, on average, 15 - 25 new CRADAs under discussion and in various stages of negotiation. Fourteen new licenses and assignments were negotiated and awarded to practice ML technologies involving lubricants, infrared imaging, rigid-rod polymers, Al MMCs, CuSiC MMCs, ultrasonic NDT, two-photon chromophores, thermal history sensors, nanocarbon processing and 3-D microstructural characterization. ML received \$5,081,472.66 in CRADA income and patent licenses fees over the life of this Delivery Order. Additional activities during the period included preparing CRADA Fact Sheets; assisting ML scientists in preparing patent applications; assisting the National Park Service and W-PAFB personnel in acquiring artifacts for the Huffman Prairie Flying Field Interpretive Center; assisting ML in developing corporate technology transfer policies and a technology transfer training program; maintaining ML, AFRL and Defense Technology Transfer Information System (DTTIS) data bases; and consultation on export control and MCTL issues.

During this period, the author (Lawrence R. Bidwell, PhD, PE) was awarded the 2001 Award for Excellence in Technology Transfer by the Federal Laboratory Consortium for efforts in licensing an ML patent.

## **Technical Activity:**

### **A. Cooperative Research & Development Agreements (CRADAs) and Commercial Test Agreements (CTAs).**

The principal activity conducted under this DO was the development, negotiation and creation of CRADAs. The essential steps in this process are outlined in Appendix A. At the present time, ML has 38 active and 77 completed CRADAs and CTAs. These are listed in Appendix B.

Interim Reports are incorporated in this report by reference. See References 1–5 for CRADA activity through 30 March 2006. In the period 30 March – 31 July 2006, three new CRADAs were started, one CRADA was amended and six CRADAs were completed. The new CRADAs are with Oshkosh Trucks, Inc., the University of Maine and Kyma Technologies, Inc. The salient features of these are covered in the CRADA Notes in Appendix C. A CRADA with UDRI was extended. CRADAs were completed with General Electric Company (2), AdTech Systems Research, Inc., General Dynamics Corp., Technology Assessment and Transfer, Inc. and Infrared Fiber Systems, Inc.

See References 1–5 for CRADA Fact Sheets.

Generally, there were about 15-25 potential CRADAs under discussion or negotiation at any given time. Some of these discussions or negotiations dragged on for extended periods without progress due to disputes with a company's legal staff, uncertainties in corporate direction and changes in priorities. Appendix C lists the current CRADAs in the pipeline and the status of each. Of the potential CRADAs listed, nine, i.e., CRADAs with Applied Research Associates, Inc., Universal Technology Corp., Life Shield Engineered Systems, LLC, the University of Missouri – Columbia, Bayer Material Sciences, LLC, Infrastructure Defense Technologies, LLC, Anteon Corp., General Electric Company and Guild Associates, Inc. are in the signature process or in the final stages of development.

### **B. Patent Licenses**

Interim Reports are incorporated in this report by reference. See References 1–5 for patent license activity through 30 March 2006. No new licenses have been negotiated since that date. AFRL/ML currently has 20 active licenses and assignments. Fourteen of these were negotiated under this Delivery Order.

### **C. Technology Transfer Income**

ML Technology Transfer income has grown steadily in recent years from CRADAs, Cooperative Test Agreements (CTAs) and patent license royalties. See References 1–5 for income details to 30 March 2006. Over the life of this Delivery Order, ML received \$5,081,472.66 in technology transfer income, \$3,610,449.34 in CRADA income, \$1,324,881.81 in CTA income and \$146,141.51 in license royalty income.

#### **D. Technology Transfer Data Bases**

Technology transfer information was regularly entered into the ML Management Information System (MIS) ASTARS, the ML Technology Transfer Access Data Base and the Defense Technology Transfer Information System (DTTIS).

#### **E. Other Activities**

Over the life of the Delivery Order, ML was provided ongoing assistance in the development of corporate technology transfer policies. Consultation was also provided on a number of export control and MCTL issues.

#### **F. References**

1. Contract F33615-01-D-5801, Delivery Order 0002, Interim Report, 20 March 2001 – 31 March 2002.
2. Contract F33615-01-D-5801, Delivery Order 0002, Interim Report, 1 April 2002 – 31 March 2003.
3. Contract F33615-01-D-5801, Delivery Order 0002, Interim Report, 1 April 2003 – 31 March 2004.
4. Contract F33615-01-D-5801, Delivery Order 0002, Interim Report, 1 April 2004 – 31 March 2005.
5. Contract F33615-01-D-5801, Delivery Order 0002, Interim Report, 1 April 2005 – 31 March 2006.

## **Appendix A**

### **ML CRADA INITIATION PROCESS - 1/23/02 – Larry Bidwell**

1. Discuss CRADA with ML S&E, potential collaborator and AFMC LO/JAZ, as appropriate. This is usually an iterative process.
2. Prepare CRADA draft, using S&E/collaborator input (depending on complexity, AFMC LO/JAZ may provide assistance) and submit for review by principals. This is usually an iterative process. Send copy to AFMC LO/JAZ for preliminary legal review.
3. When a satisfactory draft is achieved, prepare final CRADA document.
4. Send two copies of the CRADA to collaborator for signature (more for multiparty CRADAs).
5. Prepare Division signature coordination package, to include: routing slip, CRADA notes, coordination copy of CRADA and the requisite number of copies for Division signature.
6. Route Division signature package to S&E, Section Leader, Branch – to Div for signature.
7. Make copy of signed CRADA and send to AFMC LO/JAZ for final legal review.
8. Prepare ML signature coordination package, to include: updated CRADA notes, coordination copy of CRADA, legal review and the requisite number of copies for AF Review signature.
9. Route AF Review signature package to McGath, Gale, MLOP, MLO for coordination and to ML for AF Review signature.
10. Assign CRADA number and print on signed CRADA documents. Make copies for files.
11. Send one CRADA original to the Collaborator and one original to the S&E for his case file. Keep two copies for the ML and working files.
12. Assign JON and enter data into the WTN, DTTIS and ASTARS databases.

## Appendix B

### ML CRADAS, CTAS, PATENT LICENSES & ASSIGNMENTS – 9/6/06

Larry Bidwell, AFRL/MLOB-UTC/52917

#### Active CRADAs & CTAs

##### MLB

Technology: Nonlinear Optical Materials

Company: Laser Photonics Technology

Status: CRADA #96-030-WL-01 signed 16 Feb 96. JON - CRDMBP06. Expires 16 Feb 08.

POC: Dr. L. S. Tan, AFRL/MLBP, 59141

Technology: Polymer Layered Silicate Nanocomposites

Company: Southern Clay Products, Inc.

Status: CRADA #99-153-ML-01 signed 2 Jun 99. JON - CRDMBP07. Expires 2 Jun 07.

POC: Dr. R. Vaia, AFRL/MLBP, 59484

Technology: High-Temperature Gas Turbine Engine Lubricants

Company: Pratt & Whitney (joint with PR)

Status: CRADA #02-043-ML-01 signed 12 Feb 02. JON - CRDMBT09. Expires 22 Jan 08.

POC: C. E. Snyder, AFRL/MLBT, 59036

Technology: Nanocomposite Coatings Comparisons

Company: Engineered Coatings, Inc.

Status: CRADA #03-301-ML-01 signed 28 Oct 02. JON – CRDMBT10. Expires 28 Oct 06.

POC: Dr. J. Zabinski, AFRL/MLBT, 54860

Technology: Fluids Testing and Evaluation

Company: UDRI

Status: CRADA #03-104-ML-01 signed 14 Apr 03. JON – CRDMBT11. Expires 14 Apr 09.

POC: C. E. Snyder, AFRL/MLBT, 59036

Technology: Vapor Grown Carbon Fiber Composites (2)

Company: Applied Sciences, Inc.

Status: CRADA #03-222-ML-01 signed 10 Aug 03. JON – CRDMBC06. Expires 10 Aug 07.

POC: Dr. K. Strong, AFRL/MLBCO, 53104

Technology: Polymer Electrolyte Membrane Fuel Cells

Company: AvMat Membranes, LLC

Status: With AFRL/PRP. CRADA #04-197-PR-01 signed 26 Jul 04. JON – CRDMBP10.  
Expires 26 Jul 07.

POC: Thuy Dang, AFRL/MLBP, 50042



Technology: Thin Ply Carbon-Fiber Technology  
Company: ILT Corporation dba Think Composites  
Status: CRADA #05-255-ML-01 signed 12 Sep 05. JON – CRDMBC08. Expires 12 Sep 07.  
POC: Dr. Vernon Bechel, AFRL/MLBCM, 59077

## MLL

Technology: Experimental Materials Processing Facility  
Company: UES  
Status: CRADA #99-025-ML-01 signed 25 Jan 99. JON - CRDMLM04. Expires 1 Dec 09.  
POC: D. Mahaffey, AFRL/MLLMP, 59840

Technology: Cooperative Research  
Company: Edison Materials Technology Center  
Status: CRADA #99-078-ML-01 signed 19 Mar 99. JON - CRDMLM06. Expires 19 Mar 09.  
POC: Dr. W .M. Griffith, AFRL/MLL, 59793

Technology: Advanced Nondestructive Evaluation  
Company: UDRI  
Status: CRADA #03-087-ML-01 signed 28 Mar 03. JON-CRDMLP02. Expires 3 Mar 09.  
POC: R. Marshall, AFRL/MLLP, 52718

Technology: Nanostructured Metallic And Ceramic Materials For Aerospace Applications  
Company: General Electric  
Status: CRADA #03-268-ML-01 signed 25 Sep 03. JON-CRDMLM12. Expires 25 Sep 06.  
POC: Dr. D. Miracle, AFRL/MLLM, 59833

Technology: Advanced Nondestructive Evaluation  
Company: Anteon Corp.  
Status: CRADA #05-011-ML-01 signed 11 Jan 05. JON-CRDMLP03. Expires 11 Jan 08.  
POC: R. Marshall, AFRL/MLLP, 52718

Technology: Characterization Facility  
Company: UES  
Status: CRADA #05-203-ML-01 signed 23 Jul 05. JON-CRDMLM13. Expires 30 Sep 06.  
POC: G. Petrak, AFRL/MLL, 59790

## MLM

Technology: Modeling & Simulation and Virtual Manufacturing  
Company: DaySys Corporation  
Status: CRADA #01-356-ML-01 signed 21 Dec 00. JON – CRDMMS01. Expires 21 Dec 06.  
POC: D. Slicer, AFRL/MLMT, 44398

## MLP

Technology: Materials Response Testing Using High Energy Lasers

Company: Anteon Corp.

Status: CRADA #95-331-WL-01 signed 28 Apr 96. JON - CRDMPJ04. Expires 30 Sep 06.

POC: J. J. Eric, AFRL/MLPJA, 54474/Ext3165

Technology: Sample Characterization and Fabrication

Company: Wright State University

Status: CRADA #93-335-WL-01 signed 18 Jan 94. JON - CRDMPA02. Expires 18 Jan 08.

POC: E. Stutz, AFRL/MLPSE, 52227/Ext3498

Technology: Bulk Production and Exploration of Novel Sensing Proteins

Company: New Century Pharmaceuticals, Inc.

Status: CRADA #02-278-ML-01 signed 5 Oct 01. JON - CRDMPJ05. Expires 5 Oct 06.

POC: Dr. R. Naik, AFRL/MLPJE, 54588, x3180

Technology: Holographic Two-Photon Induced Photo Polymerization as Applied to Telecommunications

Company: Translume, Inc.

Status: CRADA #02-065-ML-01 signed 6 Mar 02. JON - CRDMPJ06. Expires 6 Jul 07.

POC: Dr. C. Brewer, AFRL/MLPJE, 59272, x1508

Technology: Patterning and Incorporation of Nanoparticles with Biological Macromolecules

Company: Vanderbilt University

Status: CRADA #03-112-ML-02 signed 22 Apr 03. JON - CRDMPJ07. Expires 22 Apr 07.

POC: Dr. R. Naik, AFRL/MLPJE, 54588, x3180

Technology: Synthetic Amplification of Biological Systems

Company: Genencor International, Inc.

Status: CRADA #04-355-ML-01 signed 21 Dec 03. JON - CRDMPJ08. Expires 21 Dec 06.

POC: Dr. R. Naik, AFRL/MLPJE, 54588, x3180

Technology: Silicon-based Biomaterials and Sensors

Company: Genencor/Dow Corning

Status: CRADA #04-355-ML-02 signed 21 Dec 03. JON - CRDMPJ09. Expires 21 Dec 06.

POC: Dr. R. Naik, AFRL/MLPJE, 54588, x3180

Technology: Refractive Index Measurements (3)

Company: Lockheed Martin Missile and Fire Control, Inc.

Status: CRADA #04-271-ML-01 signed 27 Sep 04. JON - CRDMPS03. Expires 27 Sep 07.

POC: Dr. D. Zelmon, AFRL/MLPSO, 54588, x3231

Technology: Laser Lithography

Company: Anteon Corp.

Status: CRADA #05-039-ML-02 signed 8 Feb 05. JON - CRDMPS04. Expires 8 Feb 08.

POC: Dr. James Grote, AFRL/MLPSO, 54474/x3233

Technology: Spectral Hawk Laser Hardened Damage Threshold Characterization

Company: ITT Industries, Inc.

Status: CRADA #06-339-ML-01 signed 5 Dec 05. JON – CRDMPJ10. Expires 5 Dec 06.

POC: Gerard Simon, AFRL/MLPJ, 937-255-3808 x3158

Technology: Gallium Nitride (GaN)-Based Materials and Devices

Company: Kyma Technologies, Inc.

Status: CRADA #06-157-ML-01 signed 6 Jun 06. JON – CRDMPS04. Expires 6 Jun 09.

POC: John Blevins, AFRL/MLPSE, 54474, x 3210

## MLQ

Technology: Advanced Fire Protection Deluge System

Company: Ansul, Inc.

Status: CRADA #03-112-ML-01 signed 22 Apr 03. Expires 22 Apr 07.

POC: Virgil Carr, AFRL/MLQD, DSN 523-3744

Technology: Blast Resistant Window Development

Company: Dlubak Technologies, Inc.

Status: CRADA #04-275-ML-01 signed 2 Oct 03. Expires 2 Oct 07.

POC: Robert J. Dinan, AFRL/MLQF, 850-283-3605

Technology: Advanced Science & Technology Applications for the Gulf Coast

Company: Coastal Operations Institute

Status: CRADA #04-210-ML-01 signed 28 Jul 04. Expires 28 Jul 07.

POC: Dr. T, Stauffer, AFRL/MLQ, DSN 523-6059

Technology: Blast Resistant Drywall Panel Development

Company: Quiet Solution, Inc.

Status: CRADA #04-295-ML-01 signed 24 Oct 04. Expires 24 Oct 06.

POC: Robert J. Dinan, AFRL/MLQF, 850-283-3605

Technology: Blast Mitigation Barriers

Company: Spirit of America Corp.

Status: CRADA #05-039-ML-03 signed 8 Feb 05. Expires 8 Feb 07.

POC: Robert J. Dinan, AFRL/MLQF, 850-283-3605

Technology: Blast Resistant Concrete Products

Company: Portland Cement Association

Status: CRADA #05-119-ML-01 signed 29 Apr 05. Expires 29 Apr 07.

POC: Robert J. Dinan, AFRL/MLQF, 850-283-3605

Technology: Blast Mitigation Systems Technology Development and Validation

Company: Lockheed Martin Corp., Maritime Systems & Sensors - LS&S

Status: CRADA #06-343-ML-01 signed 9 Dec 05. Expires 9 Dec 08.

POC: Robert J. Dinan, AFRL/MLQF, 850-283-3605

Technology: Fire Fighting Technology

Company: Oshkosh Truck, Corp.

Status: CRADA #06-131-ML-01 signed 11 May 06. Expires 11 May 08.

POC: Virgil Carr, AFRL/MLQD, DSN 523-3744

Technology: Blast Mitigation Technologies

Company: University Of Maine

Status: CRADA #06-132-ML-01 signed 12 May 06. Expires 12 Aug 07

POC: Robert J. Dinan, AFRL/MLQF, 850-283-3605

## MLS

Technology: Coating Technology Integration Facility

Company: Southwest Research Institute

Status: CRADA #00-ML-01 signed 8 Nov 99. JON - CRDMSS01. Expires 22 Jan 08.

POC: W. P. Hoogsteden, AFRL/MLSSO, 59045

Technology: Aerospace Structural Materials Handbooks

Company: Purdue University

Status: CRADA #00-287-ML-01 signed 13 Oct 00. JON - CRDMSC02. Expires 31 Mar 07.

POC: N. Ontko, AFRL/MLSC, 69134

Technology: Materials Testing Facility

Company: UDRI (joint with VAS; ML is principal)

Status: CRADA #01-073-ML-01 signed 14 Mar 01. JON - CRDMSA02. Expires 31 Dec 08.

POC: L. Pfledderer, AFRL/MLSA, 54113

## Completed CRADAs & CTAs

### ML

Technology: Software for a Hazardous Material Tracking System

Company: Modern Technologies Corp.

Status: CRADA #94-242-WL-01 signed 18 Sep 94; completed 18 Sep 95. JON - CRDMI001.

POC: F. M. Borasz, AFRL/MLO, 69208

### MLB

Technology: Automated Software for Composites Analysis

Company: AdTech

Status: CRADA #89-1 signed 27 Sep 89; completed 27 Sep 90. A \$2000 royalty has been received and additional royalties may be collected in the future. JON - CRDMBM01.

POC: Dr. N. J. Pagano, AFRL/MLBC, 56762

Technology: Analysis of Composite Materials

Company: AdTech Systems Research, Inc.

Status: CRADA #91-2 signed 27 Feb 92; CRADA expired 27 Feb 93, before work was completed, due to more pressing priorities. CRADA reinitiation has been discussed. JON - CRDMBM02.

POC: Dr. S. L. Donaldson, AFRL/MLBC, 59096

Technology: Method of Synthesis of Thermoplastic Aromatic Benzoxazole Polymers

Company: DayChem Laboratories, Inc.

Status: CRADA #90-1 signed 19 Jul 90; completed 19 Jul 93. JON - CRDMBP01.

POC: B. A. Reinhardt, AFRL/MLBP, 59162

Technology: Processing of Aromatic Heterocyclic Polymers

Company: Performance Plastics, Inc.

Status: CRADA #93-099-WL-01 signed 19 May 93; completed 19 May 94. JON - CRDMBP03.

POC: B. A. Reinhardt, AFRL/MLBP, 59162

Technology: Nonlinear Optical Materials

Company: Laser Photonics Technology

Status: CRADA #93-125-WL-01 signed on 5 Jun 93; completed 5 June 95. JON - CRDMBP02.

This CRADA will be reinitiated under a new number, CRADA #96-030-WL-01, signed 18 Feb 96.

POC: B. A. Reinhardt, AFRL/MLBP, 59162

Technology: Turbine Engine Grease Development.

Company: Lubrication Technology

Status: CRADA #94-069-WL-01 signed 16 Apr 94; ended 16 Apr 95. JON - CRDMBT01.

This CRADA was reinitiated as CRADA #95-324-WL-01.

POC: C. E. Snyder, AFRL/MLBT, 59036

Technology: Fire Resistant Hydraulic Fluid Technology

Company: Reynolds Metals Co.

Status: CRADA #94-304-WL-01 signed 20 Nov 94. JON - CRDMBT04. Completed 1 Dec 97.

POC: C. E. Snyder, AFRL/MLBT, 59036

Technology: Exploration of Polymer-Based Actuators for Air Force Systems

Company: TCAM Technologies, Inc.

Status: CRADA # 96-271-WL-01 signed 31 Oct 96. JON - CRDMBP05. Completed 31 Oct 98.

POC: L. R. Denny, AFRL/MLBP, 59151

Technology: Advanced Turbine Lubricants

Company: Exxon

Status: CRADA #94-273-WL-01 signed 23 Oct 94. JON - CRDMBT02. Completed 23 Oct 98.

POC: C. E. Snyder, AFRL/MLBT, 59036

Technology: Bearing Assembly Aid

Company: Pratt & Whitney

Status: CRADA #95-283-WL-01 signed 28 Oct 95. JON - CRDMBT05. Completed 28 Oct 98.

POC: C. E. Snyder, AFRL/MLBT, 59036

Technology: Composites for General Aviation Aircraft

Company: Century Aircraft Corporation

Status: CRADA #96-149-WL-01 signed 13 Jun 96. JON - CRDMBC04. Expired 13 Jun 99.

POC: K. B. Bowman, AFRL/MLBC, 59076

Technology: High-Modulus, Self-Reinforcing Polymers

Company: Maxdem, Inc.

Status: CRADA #96-156-WL-01 signed 13 Jun 96. JON - CRDMBP04. Completed 13 Jun 99.

POC: Capt. R. Vaia, AFRL/MLBP, 59184

Technology: Application of Improved Materials and Processes to Disabled Person Aids

Company: Ergonomics, Inc.

Status: CRADA #94-347-WL-01 signed 30 Dec 94. JON - CRDMSE02. Completed 30 Dec 99.

POC: Dr. V. T. Bechel, AFRL/MLBC, 59077

Technology: Turbine Engine Grease Development.

Company: Lubrication Technology

Status: CRADA #95-324-WL-01 signed 12 Dec 95. JON - CRDMBT06. This is a reinitiation of CRADA #94-069-WL-01. Expired 12 Dec 99.

POC: C. E. Snyder, AFRL/MLBT, 59036

Technology: Advanced Composites for Infrastructure Rehabilitation

Company: Butler County

Status: CRADA #95-263-WL-01 signed 21 Nov 95. JON - CRDMBC03. Completed 25 July 00.

POC: J. P. Mistretta, AFRL/MLBC, 59059

Technology: Advanced Composites Concepts for Infrastructure

Company: Lockwood, Jones and Beals, Inc.

Status: CRADA #97-085-WL-01 signed 23 Sep 97. JON - CRDMBC05. Completed 23 Sep 00.

POC: J. P. Mistretta, AFRL/MLBC, 59059

Technology: Application of Architectural Polymer Composites

Company: Edison Polymer Innovation Corp.

Status: CRADA #94-340-WL-01 signed 20 Dec 94. JON - CRDMBC01. Expired 20 Dec 99.

POC: Dr. D. Mollenhaur, AFRL/MLBC, 59728

Technology: Durable Coatings on Aluminum

Company: Yoder Die Casting Co., Inc.

Status: CRADA #95-292-WL-01 signed 8 Nov 95. JON - CRDMBT03. Completed 8 Nov 01.

POC: M. Halliwell, AFRL/MLBT, 53877

Technology: Thermoplastic Coatings on Non-Cast Steel

Company: Harmon Technical Coatings, Inc.

Status: CRADA #98-324-ML-01 signed 20 Nov 98. JON - CRDMBT07. Expired 20 Nov 01.

POC: M. Halliwell, AFRL/MLBT, 53877

Technology: Vapor Grown Carbon Fiber Composites

Company: Applied Sciences, Inc.

Status: CRADA #95-004-WL-01 signed 22 Jan 95. JON - CRDMBC02. Completed 22 Jul 03

POC: Dr. K. Strong, AFRL/MLBCO, 53104

Technology: Book on Computer Modeling of Polymers

Company: John Wiley & Sons, Inc

Status: CRADA #03-013-ML-01 signed 13 Jan 03. JON - CRDMBP08. Terminated 3 Jan 05.

POC: Dr. A. Yeates, AFRL/MLBP, 59138

Technology: Development of Potential Energy Function Force Field Parameters

Company: Accelrys, Inc.

Status: CRADA #04-306-ML-01 signed 2 Nov 03. JON - CRDMBP09. Completed 2 Nov 05.

POC: Dr. R.J. Berry, AFRL/MLBP, 52467

Technology: Optical Characterization of Materials

Company: General Dynamics Corp..

Status: CRADA #03-112-ML-03 signed 22 Apr 03. JON - CRDMBT12. Completed 22 Apr 06.

POC: J. Costantino, AFRL/MLBT, 59330

Technology: Oil Particle Count/Contamination Measuring Technique

Company: General Dynamics Corp..

Status: CRADA #01-232-ML-01 signed 20 Aug 01. JON - CRDMBT08. Completed 20 Aug 06.

POC: S. Szaruga, AFRL/MLBT, 59064

Technology: Nanostructured Coating Materials

Company: General Electric Company

Status: CRADA #03-187-ML-01 signed 6 Jul 03. JON – CRDMBT13. Completed 6 Jul 06.

POC: Dr. R. Mantz, AFRL/MLBT, 52199

Technology: Carbon Crutch

Company: AdTech Systems Research, Inc.

Status: CRADA #04-223-ML-01 signed 10 Aug 04. JON – CRDMBC07. Completed 10 Aug 06.

POC: Dr. Vernon Bechel, AFRL/MLBCM, 59077

## **MLL**

Technology: Fiber Push-Out Apparatus

Company: Process Equipment Corp.

Status: CRADA #93-207-WL-01 signed 5 Aug 93; ended 5 Aug 94. JON - CRDMLM01. This CRADA was reinitiated under a new number, CRADA #96-099-WL-01 signed 3 Jul 96.

POC: Dr. P. Jero, AFRL/MLLN, 59818

Technology: Rolling of Titanium Aluminide Foil from RSR Sheet

Company: RibTech

Status: CRADA 93-250-WL-01 signed 30 Sep 93; completed 30 Sep 94. JON - CRDMLN02.

POC: Dr. Lee Semiatin, AFRL/MLLN, 51345

Technology: Texture Control to Improve the Properties of TiAl

Company: General Electric Corporate R&D

Status: CRADA #93-267-WL-02 signed 3 Nov 93; completed 3 Mar 95. JON - CRDMLN01.

POC: Dr. Lee Semiatin, AFRL/MLLN, 51345

Technology: Feasibility of Directionally Solidifying Gamma Titanium Aluminide

Company: General Electric Research Laboratory

Status: CRADA # 93-351-WL-01 signed 11 Jan 94; completed 10 Aug 95. JON - CRDMLM02.

POC: Dr. Dennis Dimiduk, AFRL/MLLM, 59839

Technology: Production of Ti<sub>2</sub>AlNb-based Metal Matrix Composites

Company: Atlantic Research Corp.

Status: CRADA #94-171-WL-01 signed 5 Jul 94. JON - CRDMLN03. Completed 5 Jul 98.

POC: P. Smith, AFRL/MLLM, 51384



Technology: Orthorhombic Titanium Aluminide Composite Development

Company: Atlantic Research Corporation

Status: CRADA #99-032-ML-01 signed 1 Feb 99. JON - CRDMLM05. Completed 30 Sep 00.

POC: P. Smith, AFRL/MLLM, 51348

Technology: Monazite Coating for Nextel 720 Fibers

Company: Applied Thin Films, Inc.

Status: CRADA # 98-ML-01 signed 18 May 98. JON - CRDMLN05. Completed 18 May 01.

POC: Dr. R. S. Hay, AFRL/MLLN, 59825

Technology: Advanced Nondestructive Evaluation Techniques,

Company: University of Dayton Research Institute

Status: CRADA #97-127-WL-01 signed 20 May 97. JON - CRDMLP01. Completed 20 May 02.

POC: Dr. T. J. Moran, AFRL/MLLP, 59800

Technology: Discontinuously Reinforced Copper MMCs (1)

Company: Powdermet, Inc.

Status: CRADA #02-142-ML-01 signed 22 May 02. JON - CRDMLN08. Completed 22 May 03.

POC: Dr. D. Miracle, AFRL/MLLMD, 59833

Technology: Discontinuously Reinforced Copper MMCs (2)

Company: Advanced Ceramics Corp.

Status: CRADA #02-142-ML-02 signed 22 May 02. JON - CRDMLM09. Completed 22 May 03.

POC: Dr. D. Miracle, AFRL/MLLMD, 59833

Technology: Discontinuously Reinforced Copper MMCs (3)

Company: Ceracon, Inc.

Status: CRADA #02-142-ML-03 signed 22 May 02. JON - CRDMLM10. Completed 22 May 03.

POC: Dr. D. Miracle, AFRL/MLLMD, 59833

Technology: Discontinuously Reinforced Copper MMCs (4)

Company: Honeywell Electronic Materials, Inc.

Status: CRADA #02-221-ML-01 signed 9 Aug 02. JON - CRDMLM11. Completed 9 Aug 03.

POC: Dr. D. Miracle, AFRL/MLLMD, 59833

Technology: Fiber Push-Out Apparatus

Company: Process Equipment Corp.

Status: CRADA 96-099-WL-01 signed 3 Jul 96. JON - CRDMLM03. Completed 3 Jul 04.

This was a reinitiation of CRADA #93-207-WL-01.

POC: Dr. P. Jero, AFRL/MLLN, 59818

Technology: Collaborative Technology Clusters (CTeC)

Company: EMTEC

Status: CTA #00-180-ML-01 signed 28 Jun 00. Completed 1 Sep 04.

POC: D. Mahaffey, AFRL/MLLM, 59840

Technology: Discontinuously Reinforced Aluminum MMCs

Company: Powdermet, Inc.

Status: CRADA #02-119-ML-01 signed 29 Apr 02. JON - CRDMLM07. Completed 29 Apr 05.

POC: Dr. D. Miracle, AFRL/MLLMD, 59833

## MLM

Technology: Manufacturing Technology Retirement for Cause.

Company: RJO, Inc.

Status: CRADA # 93-267-WL-01 signed 6 Apr 94. Expired 6 Apr 96.

POC: TTC, WL/MTX.

Technology: Application of Inspection Process Automation and Optimization Technology to Eddy Current Equipment and Scan Plan Technology.

Company: Systems Research Laboratories, Inc.

Status: CRADA # 94-241-WL-02 signed 29 Sep 94. Expires 29 Sep 97. Terminated 15 Dec 96. JON - CRDMIM03.

POC: Dr. S. R. LeClair, AFRL/MLMR, 58786

Technology: Electric Arc In-Situ Plating Process

Company: Hohman Plating, Inc.

Status: CRADA #95-335-WL-01 signed 19 Dec 95. JON - CRDMIM04. Completed 19 Dec 97.

POC: Dr. S. R. LeClair, AFRL/MLMR, 58786

Technology: Qualitative Modeling & Simulation of Thin Film Processing

Company: AvXm

Status: CRADA #97-126-WL-01 signed 21 May 97. JON - CRDMIM05. Completed 21 Nov 98.

POC: Dr. S. R. LeClair, AFRL/MLIM, 58786

Technology: Apply Materials Processing Knowledge to the Fabrication and Assembly of Automotive Compressors

Company: General Motors Delphi Harrison Thermal Systems and the Alliance for Education of the Dayton Foundation

Status: CRADA #96-120-WL-01 signed 15 May 96. JON - CRDM0001. Completed 15 May 00.

POC: Dr. James Malas, AFRL/MLMR, 44581

Technology: Parallel Computing

Company: A Computer for Me

Status: CRADA # 01-138-ML-01 signed 18 May 01. JON - CRDMMR02. Completed 6 Sep 01.

POC: G. Frazier, AFRL/MLMR, 58786

Technology: MBE Processing Control

Company: Technology Assessment and Transfer, Inc.

Status: CRADA #94-132-WL-01 signed 3 June 94. JON - CRDMIM02. Completed 3 Jun 03.

POC: Dr. S. R. LeClair, AFRL/MLMR, 44581

Technology: Materials Process Design Web Site

Company: Imagination Engines, Inc.

Status: CRADA # 98-ML-02 signed 24 Dec 97. JON - CRDMMR01. Completed 24 Dec 01.

POC: Dr. S. R. LeClair, AFRL/MLMR, 44581

Technology: Memory Techniques for Software Design.

Company: TechnoSoft, Inc.

Status: CRADA #94-12-WL-01 signed 6 Feb 94. JON - CRDMIM01. Expired 6 Feb 03.

POC: Dr. S. R. LeClair, AFRL/MLMR, 44581

Technology: Demonstration and Validation of the HG-1900 MEMS-Based IMU in a 2000 LB JDAM Tailkit

Company: Boeing Corporation (joint with MNG; MNG is principal)

Status: CRADA #03-176-MN-01 signed 25 Jun 03. Expired 25 Dec 03.

POC: L. Concha, AFRL/MLME, 44596

Technology: Demonstration and Validation of the HG-1900 MEMS-Based IMU in a JDAM Tailkit

Company: Boeing Corporation (joint with MNG; MNG is principal)

Status: CRADA #04-274-MN-01 signed 30 Sep 04. JON - CRDMME01. Expired 30 Mar 05.

POC: L. Concha, AFRL/MLME, 44596

## **MLP**

Technology: Stainless Steel Surface Treatments

Company: Armco

Status: CRADA #94-130-WL-01 signed 1 Jun 94. Expired 1 Jun 96. JON - CRDMPJ01.

POC: Dr. R. Crane, AFRL/MLLP, 59828.

Technology: Development of Electrically Switchable Holographic Materials and Devices

Company: Foster-Miller, Inc.

Status: CRADA #96-99-WL-02 signed 19 Apr 96. JON - CRDMPJ03. Expired 19 Apr 98.

POC: Dr. T. Bunning, AFRL/MLPJ, 54474/Ext3177.

Technology: Reduced Arsenic Waste in Semiconductor Production

Company: University of Dayton Research Institute

Status: CRADA #95-156-WL-02 signed 20 Jun 95. JON - CRDMPO01. Completed 20 Jun 98.

POC: L. S. Rea, AFRL/MLPO, 54474/Ext3213

Technology: Hybrid Low Molar Mass Glass Forming Liquid Crystalline Materials for Optical Thin Films

Company: University of Rochester

Status: CRADA #95-156-WL-01 signed 27 Jun 95. JON - CRDMPJ02. Completed 27 Jun 99.

POC: Dr. T. Bunning, AFRL/MLPJ, 54474/Ext3177

Technology: RF Effusion Cell Design and Development

Company: EPI MBE Products Group, Chorus Corp.

Status: CRADA #97-251-WL-01 signed 23 Sep 97. JON - CRDMBM03. Completed 23 Sep 00.

POC: Dr. W. V. Lampert, AFRL/MLPO, 56316

Technology: Electro-Optical Tunnel Gauge

Company: Gauge and Measurement Technologies, Ltd

Status: CRADA #94-10-WL-01 signed 6 Feb 94. JON - CRDMPA01. Completed 6 Feb 01.

POC: J. Brown, AFRL/MLPA, 52227/Ext3511

Technology: Extension of Near Infrared Imaging to the Detection of Important Anatomical Features

Company: Infrared Imaging Systems, Inc.

Status: CRADA #02-161-ML-01 signed 10 Jun 02. JON - CRDMB001. Completed 10 Jun 05.

POC: Dr. R. Crane, AFRL/MLB, 59143 and Dr. W. Johnson, AFRL/MLPJE, 53808, x3170

Technology: Refractive Index Measurements (1)

Company: Technology Assessment and Transfer, Inc.

Status: CRADA #03-141-ML-03 signed 21 May 03. JON - CRDMPS01. Completed 21 May 06.

POC: Dr. D. Zelmon, AFRL/MLPSO, 54588, x3231

Technology: Refractive Index Measurements (2)

Company: Infrared Fiber Systems, Inc.

Status: CRADA #03-166-ML-03 signed 15 Jun 03. JON - CRDMPS02. Completed 15 Jun 06.

POC: Dr. D. Zelmon, AFRL/MLPSO, 54588, x3231

## **MLQ**

Technology: Atmospheric Chemistry of Volatile Oxygenated Organic Compounds

Company: Eastman Chemical Co.

Status: CRADA # 98-ML-05 signed 18 May 98. Completed 18 May 99.

POC: Dr. R. Wells, AFRL/MLQR, DSN 523-6087

Technology: In-Situ Bioremediation

Company: EPA

Status: CRADA # 95-211-AL-01 signed 30 Jul 95. Completed 1 Jul 99.

POC: Maj. T. Wiley, AFRL/MLQE, DSN 523-6299

Technology: Nitro-Compound Biodegradation

Company: ICI Americas, Inc.

Status: CRADA # 96-055-AL-01 signed 22 Feb 96. Completed 22 Feb 00.

POC: Dr. J. Cornette, AFRL/MLQE, DSN 523-6007

Technology: Ammonium Perchlorate

Company: Thiokol Corp.

Status: CRADA # 96-314-AL-01 signed 9 Nov 96. Completed Mar 00.

POC: J. Hurley, AFRL/MLQE, DSN 523-6243

Technology: Microbial Reduction of Heavy Metals

Company: University of Florida

Status: CRADA #00-ML-02 signed 19 Jan 00. Completed 19 Jul 01.

POC: Dr. T. Stauffer, AFRL/MLQ, DSN 523-6059

Technology: Isolating and Characterizing Chlorobenzene and Parachlorobenzene Sulfonate Degrading Bacteria

Company: Pelorus Environmental and Development Corp.

Status: CRADA #99-071-ML-01 signed 12 Mar 99. Completed 12 Mar 02.

POC: Lt. Col. T. Wiley, AFRL/MLQE, DSN 523-6299

Technology: Advanced Science & Technology Applications for the Gulf Coast

Company: Coastal Operations Institute

Status: CRADA #01-025-ML-01 signed 25 Jan 01. Completed 25 Jan 03.

POC: Dr. T. Stauffer, AFRL/MLQ, DSN 523-6059

Technology: Biodegradation of Nitroaromatic Compounds

Company: ICI Canada

Status: CRADA #01-025-ML-02 signed 25 Jan 01. Completed 25 Jan 04.

POC: Dr. J. Spain, AFRL/MLQL, DSN 523-6058

Technology: Blast Resistant Window Development

Company: Madico, Inc.

Status: CRADA #03-092-ML-01 signed 2 Apr 03. Completed 2 Apr 05.

POC: W. S. Strickland, AFRL/MLQD, DSN 283-9706

Technology: Explosive Experiments

Company: University of Missouri

Status: CTA #05-207-ML-01 signed 26 Jul 05. Completed 30 Dec 05.

POC: Robert J. Dinan, AFRL/MLQF, 850-283-3605

## MLS

Technology: Rain Erosion Testing of Aerospace Materials

Company: University of Dayton Research Institute

Status: CRADA #96-085-WL-01 signed 8 Apr 96. JON - CRDMSE03. Completed 30 May 00.

POC: L. Pfledderer, AFRL/MLSA, 54113

Technology: Engineering Data

Company: Purdue University

Status: CRADA #91-1 signed 12 Jun 91. JON - CRDMSE01. Completed 30 Sep 00.

POC: N. Ontko, AFRL/MLSC, 55128

Technology: Orthopedic Device Development and Testing

Company: Wright State University

Status: CRADA #99-222-ML-01 signed 10 Aug 99. JON - CRDMSC01. Completed 10 Aug 02.

POC: N. Ontko, AFRL/MLSC, 69134

Technology: Degradation Testing of Aerospace Materials

Company: University of Dayton Research Institute

Status: CRADA #99-139-ML-01 signed 19 May 99. JON - CRDMSA01. Expired 30 May 03.

POC: L. Pfledderer, AFRL/MLSA, 54113

Technology: Automotive Applications of By-Wire Technology

Company: Delphi Automotive Systems (joint with PRP and VAC; PRP is principal)

Status: CRADA #01-156-PR-01 signed 19 Jun 01. JON - CRDMSA03. Completed 19 Jun 04.

POC: G Slenski, AFRL/MLSA, 69147

### **Patent Licenses & Assignments**

Technology: Process for Preparing Pitch Foams and Products So Produced

Patent: U. S. Patent Nos. 5,868,974 and 5,961,814

Company: MER Corporation

Status: Non-exclusive license signed 17-Sep-98. License #98-260-ML-01

POC: K. Kearns, AFRL/MMLBC, 53670

Technology: Holographic Polymer Dispersed Liquid Crystals

Patent: U. S. Patent No. 5,942,157

Company: Science Applications International Corp.

Status: Exclusive license signed 28 Jun 00. License #00-180-ML-02

POC: Dr. T. Bunning, AFRL/MLPJ, 54474/Ext3177

Technology: Lubricity & Stability Additives for High Temperature Gas Turbine Engine Oils

Patent: U.S. Patent Nos. 5,302,760 and 5,196,130

Company: Findett Corporation

Status: Non-exclusive license signed 06-Oct-00. License #01-280-ML-01

POC: L. Gschwender, AFRL/MLBT, 57530

Technology: System and Method for Enhanced Visualization of Subcutaneous Structures

Patent: U.S. Patent No. 6,230,046

Company: Infra Red Imaging Systems, Inc.

Status: Exclusive license signed 15-Aug-01. License #01-227-ML-01

POC: Dr. R. Crane, AFRL/MLB, 59143 and Dr. W. Johnson, AFRL/MLPJ, 53808, x3170

Technology: Liquid Crystalline Compositions Composed of Rigid-Rod Polymers and Carbon Nanotubes and Products

Patent: U.S. Patent Application Serial No. 60/315,583, filed 29 August 2001.

Company: Georgia Tech Research Corporation

Status: Assignment signed 03-Dec-01. Assignment #02-337-ML-01

POC: Dr. Fred E. Arnold, AFRL/MLBP, 59160

Technology: Discontinuously Reinforced Aluminum MMCs (1)

Patent: U.S. Patent No. 6,033,622

Company: Powdermet, Inc.

Status: Non-exclusive license signed 28-Oct-02. License #03-301-ML-02

POC: Dr. D. Miracle, AFRL/MLLMD, 59833

Technology: Discontinuously Reinforced Aluminum MMCs (2)

Patent: U.S. Patent No. 6,033,622

Company: Ceracon, Inc.

Status: Non-exclusive license signed 28-Oct-02. License #03-301-ML-03

POC: Dr. D. Miracle, AFRL/MLLMD, 59833

Technology: Discontinuously Reinforced Aluminum MMCs (3)  
Patent: U.S. Patent Application No. 6,033,622  
Company: Ixion Technologies, Inc.  
Status: Non-exclusive license signed 17-Sep-03. License #03-260-ML-01  
POC: Dr. D. Miracle, AFRL/MLLMD, 59833

Technology: Metal Matrix Composite Material with High Thermal Conductivity and Low CTE (1)  
Patent: U.S. Patent Application No. 10/295,549.  
Company: Ceracon, Inc.  
Status: Non-exclusive license signed 3-Oct-03. License #04-276-ML-01  
POC: Dr. D. Miracle, AFRL/MLLMD, 59833

Technology: Metal Matrix Composite Material with High Thermal Conductivity and Low CTE (2)  
Patent: U.S. Patent Application No. 10/295,549.  
Company: Ixion Technologies, Inc.  
Status: Non-exclusive license signed 3-Oct-03. License #04-276-ML-02  
POC: Dr. D. Miracle, AFRL/MLLMD, 59833

Technology: Phased Array Ultrasonic NDT System for Fasteners  
Patent: U.S. Patent Application S/N 10/477,034  
Company: R/D Tech, Inc.  
Status: Exclusive license signed 9-Aug-04. License #04-222-ML-01  
POC: Pamela Herzog, AFRL/MLSST, DSN 339-2341

Technology: Sulphonic Acid Pendant Arylenethioether Sulfone Polymer Compositions  
Patent: U.S. Provisional Patent Applications S/N 60/430,406 and 60/558,058  
Company: UDRI  
Status: Assignment signed 12 Aug 04. Assignment #04-225-ML-01  
POC: Thuy Dang, AFRL/MLBP, 50042

Technology: Two-Photon Materials  
Patent: Multiple two-photon chromophore patents  
Company: 3M  
Status: Nonexclusive license signed 18 Oct 04. License # 05-292-ML-01  
POC: Dr. L. S. Tan, AFRL/MLBP, 59141

Technology: Thermal History Sensor  
Patent: U.S. Patent Application S/N 10/801,294  
Company: GlobalSI, LLC  
Status: Nonexclusive license signed 27 Jan 05. License # 05-027-ML-01  
POC: Dr. G. Fair, AFRL/MLLN, 53232



Technology: Polymeric Thermal History Sensor  
Patent: U.S. Patent Application S/N 10/963,008  
Company: GlobalSI, LLC  
Status: Nonexclusive license signed 27 Jan 05. License # 05-027-ML-02  
POC: Dr. G. Fair, AFRL/MLLN, 53232

Technology: Thermal History Sensor  
Patent: U.S. Patent Application S/N 10/801,294  
Company: Thermal Memory Systems, Inc.  
Status: Nonexclusive license signed 27 Jan 05. License # 05-027-ML-03  
POC: Dr. G. Fair, AFRL/MLLN, 53232

Technology: Polymeric Thermal History Sensor  
Patent: U.S. Patent Application S/N 10/963,008  
Company: Thermal Memory Systems, Inc.  
Status: Nonexclusive license signed 27 Jan 05. License # 05-027-ML-04  
POC: Dr. G. Fair, AFRL/MLLN, 53232

Technology: Method of Processing Filamentary Nanocarbon  
Patent: U.S. Patent Application S/N 10/767,498  
Company: Applied Sciences, Inc.  
Status: Nonexclusive license signed 20 Apr 05. License # 05-110-ML-01  
POC: Dr. B. Maruyama, AFRL/MLBCO, 53920

Technology: High-Speed and Repeatability Serial Sectioning for 3-D Reconstruction of Microstructure  
Patent: U.S. Patent Applications S/N 10/083,919, 10/083,920, 10/083,918, 10/083,921  
Company: UES, Inc.  
Status: Exclusive license signed 13 Sep 05. License # 05-256-ML-01  
POC: Dr. J. Spowart, AFRL/MLLMD, 51340

Technology: Two-Photon Materials  
Patent: Multiple two-photon chromophore patents  
Company: 3M  
Status: Nonexclusive commercial license signed 15 May 06. License # 06-135-ML-01  
POC: Dr. L. S. Tan, AFRL/MLBP, 59141

## Appendix C

### ML CRADAs & LICENSES IN PROCESS - 9/6/06

Larry Bidwell, AFRL/MLOB-UTC/52917

#### CRADAs & CTAs

Technology: Polymer Dielectrics for High Energy Density and High Voltage Capacitors

Company: ChevronTexaco

Status: CRADA draft prepared. No recent contact.

POC: Thuy Dang, AFRL/MLBP, 50042

Technology: Biotechnology

Company: Rockwell

Status: CRADA under discussion. On hold.

POC: Dr. R. Naik, AFRL/MLPJE, 53808, x3180

Technology: Controlled Deposition Of Biological Materials

Company: Optomec Design Company

Status: CRADA Work Plan in preparation. On Hold.

POC: Dr. R. Naik, AFRL/MLPJE, 53808, x3180

Technology: TBD

Company: QinetiQ

Status: CRADA under discussion. On hold.

POC: Dr. R. Naik, AFRL/MLPJE, 53808, x3180

Technology: TBD

Company: New Century Pharmaceuticals

Status: CRADA Work Plan in preparation. On hold.

POC: Dr. R. Naik, AFRL/MLPJE, 53808, x3180

Technology: Improving Production of YBCO Tape

Company: SuperPower, Inc.

Status: CRADA draft prepared. Status unclear.

POC: T. Peterson, AFRL/MLPO, 54588, Ext 3235

Technology: Silicon-Backed Space Mirrors  
Company: Lockheed Martin  
Status: CRADA under discussion.  
POC: Dr. L.E. Matson, AFRL/MLLN, 59842

Technology: Advanced Fuel Cell and Solar Power Technologies  
Company: Applied Research Associates  
Status: CRADA written, sent to MLQ for action. Awaiting Congressional funding.  
POC: R. Salavani, AFRL/MLQD, DSN 523-6007

Technology: TBD  
Company: Canadian Brass LLC  
Status: CRADA under discussion.  
POC: Dr. Alan Katz, AFRL/MLLN, 59824

Technology: Airbase Protection Technologies  
Company: Applied Research Associates  
Status: CRADA sent to ML for signature.  
POC: P. Sheppard, AFRL/MLQO, DSN 523-6276

Technology: NDE of Precision Micromachining and Microforming of Materials  
Company: MLPC, Inc.  
Status: CRADA in preparation. Will be expanded to cover additional topics and Divisions.  
POC: Dr. J. Blackshire, AFRL/MLLP, 50198

Technology: Body Armor Materials  
Company: Excera Materials Group, Inc.  
Status: On hold. Status unclear.  
POC: Lt. T.J. Turner, AFRL/MLLMP, 57416

Technology: Advanced Virtual Engine Test Cell  
Company: AVETeC  
Status: CRADA being revised. Joint with PR.  
POC: Dr. R Dutton, AFRL/MLLM, 51305

Technology: Carbon Foam Technologies  
Company: Firefly Energy, Inc.  
Status: CRADA under discussion.  
POC: Dr. B. Maruyama, AFRL/MLBCO, 53920

Technology: NDE  
Company: UTC  
Status: Draft CRADA prepared and being reviewed. JAZ approved draft.  
POC: John Brausch, AFRL/MLSA, 69151

Technology: Sheet Polymer Retrofit Technology and Validation  
Company: Life Shield Engineered Systems, LLC  
Status: CRADA sent out for signature.  
POC: Robert J. Dinan, AFRL/MLQF, 850-283-3605

Technology: Blast Mitigation Technologies  
Company: University of Missouri-Columbia  
Status: CRADA sent out for signature.  
POC: Robert J. Dinan, AFRL/MLQF, 850-283-3605

Technology: Polymer Coatings for Blast Mitigation  
Company: Bayer Material Science LLC  
Status: Request to initiate foreign CRADA in preparation.  
POC: Robert J. Dinan, AFRL/MLQF, 850-283-3605

Technology: Blast Mitigation Technologies  
Company: Infrastructure Defense Technologies, LLC  
Status: CRADA sent out for signature.  
POC: Robert J. Dinan, AFRL/MLQF, 850-283-3605

Technology: Materials Response Testing Using High Energy Lasers  
Company: Anteon Corp.  
Status: CRADA in MLP for signature.  
POC: J. J. Eric, AFRL/MLPJA, 54474/Ext3165

Technology: Method for Analysis of Triaxial Braid and Twill Composites  
Company: GE Global.  
Status: CRADA in preparation.  
POC: Dr. David Mollenhauer, AFRL/MLBCM, 59728

Technology: Material Development, Materials Production Process Development, Material System Integration and Testing  
Company: Guild Associates, Inc.  
Status: Draft CRADA prepared  
POC: Dr. R. Naik, AFRL/MLPJE, 53808, x3180

Technology: Fretting Testing  
Company: UTC  
Status: Draft CRADA being prepared.  
POC: Ben Phillips, AFRL/MLBT, 52387

### Licenses & Assignments

Technology: Processable Thermally Stable Addition Polyimide for Composite Applications (1)

Patent: U.S. Patent Application S/N 60/477,034

Company: Performance Polymer Solutions, Inc.

Status: Patent license submitted for signature.

POC: Dr. Katie Thorp, AFRL/MLBCO, 51138

Technology: Manufacture of a Closed-Cell Octet Structure

Patent: U.S. AFD 656

Company: Lattice Block Structures, Inc.

Status: Patent claims are being modified.

POC: Capt. W. Sanders, AFRL/MLLN, 51351

Technology: Liquid Platinum Acetylide Optical Chromophore

Patent: U.S. AFD 715

Company: Innovative Scientific Solutions, Inc.

Status: Chromophore under evaluation.

POC: Dr. T. Cooper, AFRL/MLPJE, 53808, x3157